s1061443_hw2

Numpy

Q1

```
# 1061443_李杰穎
'''
data = np.array([1,2,3,4,5,6,7,8,9,10,
                 11,12,13,14,15,16,17,18,19,20,
                 21,22,23,24,25,26,27,28,29,30,
                 31,32,33,34,35,36,37,38,39,40,
                 41,42,43,44,45,46,47,48,49,50])
data.sum()
'''
```

```
1275
```

Q2

```
# 1061443_李杰穎
'''
np.random.seed(0)
rnd_data = np.random.randn(10)
print('最小值：', rnd_data.min())
print('最大值：', rnd_data.max())
print('總和：', rnd_data.sum())
'''
```

```
最小值： -0.977277879876411
最大值： 2.240893199201458
總和： 7.380231707288347
```

Q3

```
# 1061443_李杰穎
'''
data = np.ones((25), dtype = np.int64)*3
data = data.reshape(5, 5)
print(np.dot(data, data))
'''
```

```
[[45 45 45 45 45]
 [45 45 45 45 45]
 [45 45 45 45 45]
 [45 45 45 45 45]
 [45 45 45 45 45]]
```

Q4

```
# 1061443_李杰穎
'''
%precision 3
np.random.seed(1)
array1 = np.random.randn(16).reshape(4, 4)
print('array1:\n', array1)
np.random.seed(2)
array2 = np.random.randn(16).reshape(4, 4)
print('array2:\n', array2)
print('array1*array2:\n', array1*array2)
print('array1dotarray2:\n', np.dot(array1, array2))
'''
```

```
array1:
 [[ 1.624 -0.612 -0.528 -1.073]
 [ 0.865 -2.302  1.745 -0.761]
 [ 0.319 -0.249  1.462 -2.06 ]
 [-0.322 -0.384  1.134 -1.1  ]]
array2:
 [[-0.417 -0.056 -2.136  1.64 ]
 [-1.793 -0.842  0.503 -1.245]
 [-1.058 -0.909  0.551  2.292]
 [ 0.042 -1.118  0.539 -0.596]]
array1*array2:
 [[-0.677  0.034  1.128 -1.76 ]
 [-1.552  1.937  0.877  0.948]
 [-0.338  0.227  0.806 -4.722]
 [-0.013  0.429  0.611  0.656]]
array1dotarray2:
 [[ 0.934  2.103 -4.647  2.855]
 [ 1.889  1.154 -2.454  8.739]
 [-1.318  1.166 -1.111  5.413]
 [-0.422  0.54   0.528  3.204]]
```

Pandas

Q1

```
# 1061443_李杰穎
'''
attri_data_frame1[attri_data_frame1['Money'] >= 500]
'''
```

	ID	Sex	Money	Name
0	1	F	1000	Alice
1	2	F	2000	Bob
2	3	M	500	Candy
4	5	F	700	Ella

Q2

```
# 1061443_李杰穎
'''
attri_data_frame1.groupby('Sex')['Money'].mean()
'''
```

```
Sex
F    1233.333333
M     400.000000
Name: Money, dtype: float64
```

Q3

```
# 1061443_李杰穎
'''
attri_data_frame3 = pd.merge(attri_data_frame1, attri_data_frame2)
attri_data_frame3
'''
```

	ID	Sex	Money	Name	Math	English
0	3	M	500	Candy	60	80
1	4	M	300	David	30	20

Q4

```
# 1061443_李杰穎
'''
attri_data_frame3.mean()
'''
```

```
ID          17.0
Money      400.0
Math        45.0
English     50.0
dtype: float64
```

Pandas Advanced

Q1

```
# 1061443_李杰穎
'''
data[data['Money'] == data['Money'].min()]
'''
```

	ID	Sex	Money
88	89	F	970.842622

Q2

```
# 1061443_李杰穎
'''
data[data['Money'] > 1010]
'''
```

	ID	Sex	Money
0	1	F	1017.886285
13	14	M	1017.095731
22	23	M	1014.861484
31	32	F	1019.761108
38	39	M	1011.239780
50	51	F	1010.131834
52	53	F	1011.081875
53	54	F	1011.193907
54	55	F	1014.875431
60	61	F	1010.481475
61	62	F	1013.337378
63	64	M	1017.746450
69	70	M	1019.389785
73	74	F	1017.696273
79	80	F	1013.916629
85	86	F	1011.678823
99	100	F	1021.581493

Q3

```
# 1061443_李杰穎
'''
data[data['Money'] > 1010].sort_values(by='Money', ascending=False)
'''
```

	ID	Sex	Money
99	100	F	1021.581493
31	32	F	1019.761108
69	70	M	1019.389785
0	1	F	1017.886285
63	64	M	1017.746450
73	74	F	1017.696273
13	14	M	1017.095731
54	55	F	1014.875431
22	23	M	1014.861484
79	80	F	1013.916629
61	62	F	1013.337378
85	86	F	1011.678823
38	39	M	1011.239780
53	54	F	1011.193907
52	53	F	1011.081875
60	61	F	1010.481475
50	51	F	1010.131834

Fillna

Q1

```
# 1061443_李杰穎
'''
df2.dropna()
'''
```

	0	1	2	3	4	5
0	0.548814	0.715189	0.602763	0.544883	0.423655	0.645894
1	0.437587	0.891773	0.963663	0.383442	0.791725	0.528895
3	0.778157	0.870012	0.978618	0.799159	0.461479	0.780529
4	0.118274	0.639921	0.143353	0.944669	0.521848	0.414662
9	0.208877	0.161310	0.653108	0.253292	0.466311	0.244426
11	0.820993	0.097101	0.837945	0.096098	0.976459	0.468651
12	0.976761	0.604846	0.739264	0.039188	0.282807	0.120197
13	0.296140	0.118728	0.317983	0.414263	0.064147	0.692472
14	0.566601	0.265389	0.523248	0.093941	0.575946	0.929296

Q2

```
# 1061443_李杰穎
'''
df2.fillna(0)
'''
```

	0	1	2	3	4	5
0	0.548814	0.715189	0.602763	0.544883	0.423655	0.645894
1	0.437587	0.891773	0.963663	0.383442	0.791725	0.528895
2	0.000000	0.925597	0.071036	0.087129	0.020218	0.832620
3	0.778157	0.870012	0.978618	0.799159	0.461479	0.780529
4	0.118274	0.639921	0.143353	0.944669	0.521848	0.414662
5	0.264556	0.774234	0.000000	0.568434	0.018790	0.617635
6	0.612096	0.616934	0.000000	0.681820	0.359508	0.437032
7	0.697631	0.060225	0.000000	0.000000	0.210383	0.128926
8	0.315428	0.363711	0.570197	0.000000	0.988374	0.102045
9	0.208877	0.161310	0.653108	0.253292	0.466311	0.244426
10	0.158970	0.110375	0.656330	0.138183	0.196582	0.000000
11	0.820993	0.097101	0.837945	0.096098	0.976459	0.468651
12	0.976761	0.604846	0.739264	0.039188	0.282807	0.120197
13	0.296140	0.118728	0.317983	0.414263	0.064147	0.692472
14	0.566601	0.265389	0.523248	0.093941	0.575946	0.929296

Q3

```
# 1061443_李杰穎
'''
df2[0] = df2[0].fillna(df2[0].mean())
df2[1] = df2[1].fillna(df2[1].mean())
df2[2] = df2[2].fillna(df2[2].mean())
df2[3] = df2[3].fillna(df2[3].mean())
df2[4] = df2[4].fillna(df2[4].mean())
df2[5] = df2[5].fillna(df2[5].mean())
df2
'''
```

	0	1	2	3	4	5
0	0.548814	0.715189	0.602763	0.544883	0.423655	0.645894
1	0.437587	0.891773	0.963663	0.383442	0.791725	0.528895
2	0.485778	0.925597	0.071036	0.087129	0.020218	0.832620
3	0.778157	0.870012	0.978618	0.799159	0.461479	0.780529
4	0.118274	0.639921	0.143353	0.944669	0.521848	0.414662
5	0.264556	0.774234	0.588126	0.568434	0.018790	0.617635
6	0.612096	0.616934	0.588126	0.681820	0.359508	0.437032
7	0.697631	0.060225	0.588126	0.388038	0.210383	0.128926
8	0.315428	0.363711	0.570197	0.388038	0.988374	0.102045
9	0.208877	0.161310	0.653108	0.253292	0.466311	0.244426
10	0.158970	0.110375	0.656330	0.138183	0.196582	0.495949
11	0.820993	0.097101	0.837945	0.096098	0.976459	0.468651
12	0.976761	0.604846	0.739264	0.039188	0.282807	0.120197
13	0.296140	0.118728	0.317983	0.414263	0.064147	0.692472
14	0.566601	0.265389	0.523248	0.093941	0.575946	0.929296